

## Appendix A

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### **Fish and Wildlife Coordination**

EPH-2003  
ENV-4.00

MEMORANDUM

To: Fish and Wildlife Service, PO Box 848, Ephrata WA 98823  
Attention: Mark Miller, Field Supervisor

From: William D. Gray  
Deputy Area Manager

Subject: Species List Request - Banks Lake Drawdown Study, 2000 FCRPS Biological  
Opinion, RPA Action 31

Reclamation is requesting a list of threatened and endangered species, candidate species and species of concern as required by the Endangered Species Act to be incorporated into the study for the proposed additional 5-foot drawdown of the reservoir in August.

This project is located at Banks Lake in Grant County, Washington, north of Coulee City, Washington, and south of Grand Coulee, Washington.

Reclamation is in the process of preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act. The draft EIS will evaluate impacts of lowering the surface elevation of the reservoir from 1565 feet to 1560 feet during the month of August each year.

Should you have any questions regarding this request, please contact Jim Blanchard at (509) 754-0226.

Attachment

bc: Regional Director, Boise ID  
Attention: PN-6519

Upper Columbia Area Office, Yakima WA  
Attention: UCA-1600

EPH-2000, -2003, -2704-3

JBlanchard:ln:5-7-01



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

*Ecological Services*

*P. O. Box 848*

*Ephrata, Washington 98823*

*Phone: 509-754-8580 Fax: 509-754-8575*

May 30, 2001

William D. Gray  
Bureau of Reclamation  
Ephrata Field Office  
P.O. Box 815  
Ephrata, Washington 98823

RE: Species List Request  
FWS Reference: 01-SP-E0335

Dear Mr. Gray:

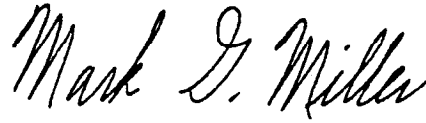
We have received your request for information on endangered and threatened species and their habitats that may be present near Banks Lake located in Grant and Douglas Counties, Washington. The following threatened and endangered species, and candidate species may be present within the project area: **Endangered**; none **Threatened**; Bald eagle (*Haliaeetus leucocephalus*) and Ute ladies'-tresses (*Spiranthes diluvialis*) **Candidate**; Washington ground squirrel (*Spermophilus washingtoni*) and Western sage grouse (*Centrocercus urophasianus*)

Should the Biological Assessments (BA) for the proposed projects indicate that a listed species is likely to be affected (adversely or beneficially) by the project, the federal agency or its designated representative should request section 7 consultation through this office. If the BA indicates that the proposed action is "not likely to adversely affect" a listed species, the federal agency or its designated representative should request Service concurrence with that determination through the informal consultation process. If the BA indicates the project to have "no effect," we would appreciate receiving a copy for our information.

There are other species, including anadromous fishes that have been federally listed by the National Marine Fisheries Service (NMFS). Some of these species may occur in the vicinity of your project. Please contact NMFS in Lacey, WA at (360) 481-5742 to request a species list.

Thank you for your efforts to protect our nation's species and their habitats. If you have additional questions regarding responsibilities under the Act, please contact Gregg Kurz of this office at (509) 754-8580.

Sincerely,

A handwritten signature in black ink that reads "Mark G. Miller". The script is fluid and cursive, with the first letters of each word being capitalized and prominent.

Supervisor



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
P. O. Box 848

Ephrata, Washington 98823  
Phone: 509-754-8580 Fax: 509-754-

March 21, 2002

To: Bill Gray, Project Manager, Ephrata Field Office,  
Bureau of Reclamation, Ephrata, Washington

From: Mark G. Miller, Project Leader, Ephrata Field Office  
Fish and Wildlife Service, Ephrata, Washington

Subject: Banks Lake 10-Foot Drawdown Draft Coordination Act Report (CAR)  
FWS Reference: 01-SP-E0335

Attached is the U.S. Fish and Wildlife Service's (Service) Draft Coordination Act Report (CAR) for the Bureau of Reclamation's (BOR) Banks Lake 10-foot drawdown. The Service requests your concurrence on this report. This CAR was prepared pursuant to the Fiscal Year 2001 Scope-of-Work and Interagency Agreement between the Service and the BOR. This CAR is provided under the authority of and in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended, 16 U.S.C. 661 et seq).

The BOR has proposed this 10-foot drawdown as part of a strategy to augment flows in the Columbia River for the spring and summer juvenile outmigration of threatened and endangered salmonid stocks in addition to meeting target flows at McNary Dam. Information in this CAR was provided in part through the Service's Planning Aid Memorandum (PAM) for the Bank's Lake Resource Management Plan (RMP). The study design in this PAM was specifically designed to help characterize vegetation within the study area, evaluate habitat types to be included in a Geographical Information System (GIS) database for the study area, identify important wildlife resources and unique or sensitive habitats, assess existing resource impacts, determine ways to avoid adverse impacts to wildlife resources and habitats, and make recommendations for future management actions. Analysis in this report is based on a series of habitat and wildlife surveys; aerial photos, maps and other information provided by the BOR; observations and prior knowledge of the Service and Washington Department of Fish and Wildlife (WDFW) personnel; literature; resource information readily available from our files; and conversations with the BOR, WDFW, Washington State Park and Recreation, and Bureau of Land Management personnel.

We appreciate the opportunity to provide the attached CAR. Comments regarding this document should be filed with the Service no later than two weeks from the issuance of this document and addressed to Steve Lewis of my staff.

#### ATTACHMENTS

CC: USFWS, Spokane, (Susan Martin)  
WDFW, Olympia, (Shane Scott)  
WDFW, Ephrata, (Jeff Korth)  
NMFS, Ellensburg, (Dale Bambrick)  
BOR, Ephrata, (Jim Blanchard)

**DRAFT  
FISH AND WILDLIFE COORDINATION ACT REPORT  
FOR THE  
U.S. BUREAU OF RECLAMATION'S  
BANKS LAKE 10-FOOT DRAWDOWN STUDY**

**PREPARED BY**

**U.S. FISH AND WILDLIFE SERVICE  
EASTERN WASHINGTON FIELD OFFICE  
EPHRATA, WASHINGTON**



**PREPARED FOR**

**U. S. BUREAU OF RECLAMATION  
COLUMBIA IRRIGATION PROJECT  
EPHRATA, WASHINGTON**

**March 2002**

## **Executive Summary**

The Bureau of Reclamation (BOR) of Grant County operates Banks Lake as a re-regulation reservoir for the Columbia Basin Project (CBP). The reservoir is approximately 27 miles long and contains slightly more than one million acre feet of water at full pool. The water supply for the reservoir is stored behind Grand Coulee Dam and is lifted from Franklin Delano Roosevelt Reservoir into Banks Lake. Water is delivered into the Main Canal at Dry Falls Dam on the southern end of Banks Lake and from there delivered to approximately 670,000 acres. This is just over one-half of the authorized lands for the CBP. The BOR currently operates the reservoir in the top five feet of the pool between elevations 1565 feet and 1570 feet.

Action 31 of the Federal Columbia River Power System (FCRPS) Biological Opinion (BO) issued by the National Marine Fisheries Service (NMFS) on December 21, 2000 calls for the assessment of operation of Banks Lake at up to 10 feet below full pool beginning in August of each year to enhance flows in the Columbia River during the juvenile outmigration of salmonid stocks listed under the Endangered Species Act (ESA). An annual lowering in August to elevation 1560 (10 feet below full pool) would constitute a change in how Banks Lake has been operated over the last 20 years. After August 31, refill would continue as currently allowed under existing authority.

The purpose of this project is to enhance the probability of meeting target flows in the Columbia River at McNary Dam during the juvenile outmigration of ESA listed salmonid stocks by altering the August drawdown of Banks Lake from elevation 1565 feet down to elevation 1560 feet, in compliance with Action No. 31 of the Reasonable and Prudent Alternative of the Federal Columbia River Power System Biological Opinion, issued by the National Marine Fisheries Service on December 21, 2000.

A Notice of Intent to prepare an Environmental Impact Statement (EIS) on altering existing operations at Banks Lake (i.e an annual drawdown of up to 10 feet from full pool) and an announcement of public scoping meetings appeared in the Federal Register on April 25, 2001. A meeting notice describing the project, requesting comments, providing a return postage paid envelope, and announcing the date, time, and location of the public scoping meeting was mailed to over 300 potentially interested individuals, groups, and governmental agencies. A press release announcing the public meetings was issued to area media.

The Banks Lake study area exhibits a wide range of fish and wildlife species and associated habitat zones. These include the presence of various raptor species which utilize the adjacent cliff habitat to cold-water and warm-water fish species which inhabit distinct areas in the water column of Banks Lake. The U.S. Fish and Wildlife Service (Service) has developed a series of recommendations in the following draft Fish and Wildlife Coordination Act Report (CAR) which attempt to preserve these unique fish and wildlife species and accompanying habitats while at the same time providing and examining the optimum scenario under which flow augmentation will be used to enhance populations of threatened and endangered salmonid stocks in the Columbia.



## **Introduction**

Banks Lake is a re-regulation reservoir for the Columbia Basin Project (CBP) which is located in the upper Grand Coulee in central Washington State. Banks receives its water supply from Grand Coulee Dam which is located on the Columbia River approximately 380 feet below the elevation of the Lake. Banks Lake was developed by the Bureau of Reclamation (BOR) primarily to receive and store water from the Columbia River via pumps at Grand Coulee Dam. These pumps have the capability of supplying up to 20,000 cubic feet per second (cfs) of water. It then provides the irrigation water supply for the Columbia Basin Irrigation Project through a system of canals and laterals starting at the southern end of Banks Lake at the Main Canal.

Banks Lake holds over one million acre/feet (ac./ft.) of water, but supplies over 2.4 million ac./ft. to the Project each year. Therefore, the reservoir is replenished about two and a half times during the irrigation season. The lands around the reservoir are managed by a group of agencies with the major portion of the land being managed by the State of Washington through the Washington Department of Fish and Wildlife (WDFW) and the Washington State Parks Commission (Parks). Other management entities include Coulee City, Electric City, Town of Grand Coulee and a half section of land owned by the Department of Natural Resources (Sunbanks Resort). By state law the water surface is managed by the Grant County Sheriff.

The BOR must manage Banks Lake to meet irrigation commitments, assure public safety, and protect property. Aside from those constraints, the BOR has considerable flexibility in managing for a variety of other important resources, such as fish and wildlife and their habitats, cultural resources, recreational activities, education, etc. Currently, the BOR has transferred recreation and fish and wildlife management responsibilities at Banks Lake to the Washington Department of Fish and Wildlife (WDFW) and Washington State Parks and Recreation Commission (WSPRC) under a 1953 memorandum of agreement. The BOR is proposing a 10-foot drawdown from the normal peak elevation of Banks Lake (1570 feet to 1560 feet) with the expressed goal of increasing Columbia River flow and assisting the outmigration of juvenile salmonids. The first five feet of water would most likely be taken from Banks Lake during July 2002 followed by the remaining five feet in August 2002. Approximate acreage exposed during 10-foot drawdown would be 3,000 acres per five feet of drawdown or 6,000 acres total.

BOR recently completed a public process to develop a Resource Management Plan for Banks Lake (Banks Lake Resource Management Plan, March 2001) which included participation from all managing partners. As part of the process, BOR also entered into an agreement with USFWS to develop guidance on fish and wildlife resources at the reservoir. Recommendations received from the USFWS were used in conjunction with advice received from WDFW to develop the RMP. A Fish and Wildlife Coordination Act Report (CAR) was completed during the RMP process. Much of the information supplied by the two agencies was incorporated into an Environmental Assessment. In addition, BOR had requested and received a species list from the USFWS for the drawdown study.

WDFW has had a representative at the public scoping meeting, but the BOR had not received specific information from that agency as to any concerns they may have regarding this project. It is anticipated that some information, in addition to that received for the RMP, may be available from WDFW and will be solicited by BOR. In particular, we hope WDFW will provide more specific information on possible impacts to the fishery in the reservoir.

This Fish and Wildlife Coordination Act Report (CAR) is provided to the BOR to assist with the with the evaluation of the 10-foot drawdown of Banks Lake. It has been prepared by the U.S. Fish and Wildlife Service (Service) under the authority of and in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). This final CAR constitutes the report of the Service and the Department of the Interior (DOI) pursuant to section 2 (b) of the FWCA, on the proposed Banks Lake RMP.

### **Study Area**

The study area for this proposed action included Banks Lake and the BOR lands surrounding Banks Lake. Initially, the BOR also included Northrup Canyon in the study area, because of its ecological connectivity with Banks Lake, although it is administered by WSPRC and Bureau of Land Management. They also funded the Service to conduct some studies in Northrup Canyon related to the issuance of the Banks Lake RMP. Northrup Canyon provides important and unique habitat for a diverse complement of wildlife species. Unfortunately, the RMP does not discuss how actions at Banks Lake may impact resources of Northrup Canyon. Nor does it describe what actions could be performed at Northrup Canyon to protect and enhance important resources. However, we refer the reader to the Service's 1998 and 1999, Planning Aid Memorandums on the Banks Lake RMP (U.S. Fish and Wildlife Service, 1998 and 1999), for some information on Northrup Canyon.

In the rain shadow of the Cascade Mountains lies the Columbia Basin Plateau. This region of steppe and shrub-steppe vegetation includes most of central and southeastern Washington state where bunchgrass and sagebrush communities were historically dominant. Banks Lake is situated in the big sagebrush-bluebunch wheatgrass (*Artemisia tridentata-Agropyron spicatum*) zonal series (Daubenmire 1988). Much of the surrounding area has been converted to dryland and irrigated agriculture. Summer daytime temperatures average about 18.3E C (65.0E F) and winter daytime temperatures average -1.7E C (29.0E F) (U. S. Soil Conservation Service 1984). Annual precipitation averages 30.5 cm (12 inches).

### *Geologic History-*

Banks Lake lies within the geographic feature known as the Grand Coulee. The Grand Coulee was cut by historic glacial floods when they were temporarily diverted from the Columbia River by glacial ice blockages. Flood waters had formed when an ice dam blocked the Clark Fork River in the Bitterroot Mountains and created a vast impoundment in Montana (Daubenmire 1988). Flood waters were discharged, perhaps multiple times, when the Lake Missoula ice dam breached and cut through the Columbia Basin forming what is now known as the channeled scablands. The

Grand Coulee is the largest of the flood channels and is characterized by steep basalt cliffs and extensive talus slopes.

### *Banks Lake History-*

Banks Lake Reservoir was established in 1951 when the BOR flooded 10,926.5 ha (27,200 ac) along a 46.5 km (28.9 mi) section of the upper Grand Coulee between two earth-filled dams (Wolcott 1964). A pumping plant lifts water from the Franklin D. Roosevelt Reservoir, situated on the Columbia River, up 111.2 m (365 ft) into the 2.5 km (1.6 mi) Feeder Canal into Banks Lake (Stober et al. 1979). Banks Lake's primary function is that of an equalizing reservoir for the Columbia Basin Irrigation Project. Irrigation water is withdrawn from the south end of the lake at Dry Falls Dam. From here, the water diversions meet agricultural requirements on about 670,000 acres of farmland included as Columbia Basin Project lands (Stober et al. 1979).

### **Evaluation Methodology**

The Environmental Impact Statement (EIS) for the drawdown will be developed using existing data from all available sources. Much of the information has been developed and compiled during the writing of the Banks Lake Resource Management Plan (RMP). Information on many of the individual resources and the impacts to those resources will be taken from that recent document. If there are specific resources that will be impacted differently than what was described in the RMP and future EIS, then those impacts will be developed and examined. One resource that should have some impacts different from the RMP is soils and the resultant erosion occurring at the reservoir. However, the information needed to describe impacts is included in the RMP and will be used in this document. The BOR is developing some new data on water quality for this Coordination Act Report (CAR) and this drawdown may give us an indication of impacts from a larger drawdown perspective. This data is being developed by using electronic equipment to measure water quality parameters across the reservoir in three transects and comparing results against data gathered at other surface elevations to determine if drawdown affects the quality or stratification of temperature regimes, dissolved oxygen or other parameters. However, it is anticipated that the drawdowns will not impact water quality in the reservoir or the delivery system.

### **Fish and Wildlife Resources**

Much of the following information on fish and wildlife species present, or potentially present, within the Banks Lake RMP study area was taken from the Service's 1998 and 1999 Planning Aid Memorandums for the Banks Lake RMP and the actual Banks Lake RMP. Results in those documents were from a variety of surveys and observations of wildlife and habitat during studies in 1997, 1998, and 1999 as well as published literature and other databases. More detailed information on species within the study area can be found in those documents.

## *Birds-*

A total of 151 species of birds were observed within the study area during the Service's studies. Only two additional species have been confirmed through Smith et al. (1997) and WDFW's Wildlife Heritage Database. Breeding evidence was observed for fifty-five species, with a breeding record for one additional species, Clark's grebe (*Aechmophorous clarkii*) in Smith et al. (1997).

Raptors - The presence of large amounts of excellent raptor nesting habitat in the basalt cliffs and diversity of other habitat within the study area has resulted in a high diversity of raptors using the study area. This is perhaps best highlighted with the nesting peregrine falcons, nesting bald eagles, large wintering concentration of bald eagles, and nesting by other sensitive species. Eleven raptor species were observed during Service studies, with many nesting in the study area.

Bald eagles were the most common raptor observed during raptor surveys. They were found around the entire lake, typically perched in larger trees along the shoreline, usually either black cottonwood or ponderosa pine. They also perched on rocky islands and outcrops near the shore and on rock outcrops up to 0.8 km (0.5 mi) from shoreline (sometimes very high on the cliff face), and on ice late in winter. Most of the large trees along the shoreline were used by eagles sometime during the winter, and about a dozen specific trees almost always contained one to ten eagles. The general locations of those trees are included on the enclosed figures.

Bald eagles observed during counts at the communal roosts near Osborn Bay and lower Northrup Canyon perched on dead limbs and snags of ponderosa pine and Douglas-fir. The high count in 1998 was 126 eagles with an average count of 63 birds for that year. The high count in 1999 was 63 eagles with an average count of 46 birds. Northrup Canyon likely contains the largest bald eagle communal roost in eastern Washington.

Bald eagles have nested for several years at a site on the north side of Steamboat Rock. One chick was in the nest on June 2, 1998. In 1999, there was no nesting activity at that nest; however, a new nest was discovered near Osborn Bay. At least one eaglet fledged from this nest. In 2001, there was an active bald eagle nest on the south end of Steamboat Rock.

In 1991, the WSPRC and WDFW cooperatively developed and adopted the conservation measures described in the *Steamboat Rock Bald Eagle Nest Territory Management Plan*. The purpose of the management plan is "to create site-specific management procedures that maintain a productive eagle nest territory and integrate the management interests and goals of the land managers" (WDFW 1991). The emphasis of the plan is to preserve nesting, roosting, and foraging habitats in the Steamboat Rock bald eagle nesting territory.

Potential threats to bald eagle nesting at Banks Lake are habitat loss and disturbance during the nesting cycle. In the two nesting territories, however, significant impacts from the physical loss of habitat are not expected and disturbance is likely the most serious threat. Although the Steamboat Rock nesting pair became established and successfully nest adjacent to intense

recreational activities in the state park (for example, a popular boat-in campground is located near the nesting site), the impact of human disturbance would be expected to increase as nearby recreation activities and public awareness of the nesting eagles rise. The nest at Osburne Bay was “lost” in 2001. It was likely blown out by high winds. It was active (adults present at nest site) in May 2001, but the nest and adults were gone when visited by WDFW biologists in June 2001. The nest tree at the south end of Steamboat Rock is potentially in jeopardy because it could be cut down by beaver. Again, the greatest “threats” to this site as well as the Osburne Bay site, however, is likely human disturbance in addition to loss or reduction of food resources (i.e. waterfowl and fish).

Prairie falcons (*Falco mexicanus*) were observed during the breeding season at several locations on or near basalt cliffs. Breeding was confirmed for two of these sites (Steamboat Rock and Northrup Canyon). Peregrine falcons (*Falco peregrinus*) were observed using eyries on the basalt cliffs at the Million Dollar Mile and along the cliffs on the southwest side of the lake. Currently, a total of four active nests are present at these respective sites.

Current and future management actions should consider the well-being of this group of species. For example, nesting areas should be protected from potentially disturbing activities and adverse impacts to prey species should be avoided or at least minimized.

Colonial-nesting Birds - The three islands being used by colonial-nesting birds at the southern end of Banks Lake are an important resource in the study area. Birds observed using these islands during Service studies included great blue heron (*Ardea herodias*), black-crowned night-herons (*Nycticorax nycticorax*) California gulls (*Larus californicus*), ring-billed gulls (*Larus delawarensis*), and Caspian terns (*Sterna caspia*). Canada geese and mallard nest on these and other islands in the lake. Activities on or near the islands, which may disturb nesting birds, should be prohibited. The birds seem tolerant of fishing boats in the vicinity; however, they become very disturbed when people attempt to walk on the islands. It may be necessary to post signs on the islands if future monitoring reveals significant disturbance to nesting birds.

Nesting colonies of western grebes (*Aechmophorous occidentalis*) occur within the study area at Osburn Bay and Devils Punch Bowl, and are present in smaller numbers at other sites. They nest in the cattails and bulrushes along the edge of the lake, creating a floating vegetation mat which is anchored to the surrounding vegetation. Breeding colonies or concentrations of western grebes are listed as Priority Species by WDFW (WDFW 1996). Priority Species are those fish and wildlife species requiring protective measures and/or management guidelines to ensure their perpetuation (WDFW 1996).

The well-established western grebe colonies should be protected from potential adverse impacts. Adverse impacts could result from significant water level changes during the breeding season, large wakes from boats and personal watercraft, and other activities which disturb nesting birds, such as personal watercraft passing through emergent vegetation. A study to determine the reproductive success of western grebes in the study area would help determine the level of management that should be applied to protect these birds.

Waterfowl - An excellent diversity of waterfowl was observed during Service studies with twenty-two species recorded and breeding was confirmed for ten species. Primary waterfowl use during the breeding season occurred below Dry Falls Dam, Devils Punch Bowl, and Osborn Bay. More scattered use was in the smaller bays and inlets on the main lake and other wetlands. Waterfowl use was heaviest and contained the highest diversity of species throughout the field season in the various wetlands and ponds below Dry Falls Dam. Also, more broods were observed in this area than in the rest of the lake. Care should be taken to protect wetlands and adjacent upland habitats and reduce potential adverse impacts to this area from grazing, recreational uses, and any proposed developments or management changes.

Shorebirds - A good diversity of shorebirds was found using the Banks Lake study area; however, their numbers were low. It is likely that shorebirds are normally found in low numbers in the study area during migration and breeding seasons because there are small amounts of suitable habitat present. Some increase in habitat could be provided by managing water levels differently; however, the BOR has indicated that water level management must be tied to irrigation schedules. The area with the highest shorebird use was the area below Dry Falls Dam. Care should be taken to protect wetlands and reduce potential adverse impacts to this area from grazing, recreational uses, and any proposed developments or management changes.

Neotropical Migratory Birds - Neotropical migratory birds (NTMB) are species which breed in the United States and Canada and then migrate south to Mexico, Central or South America or the Caribbean to spend the winter. They do not include waterfowl, shorebirds, or herons and egrets, even though some species in these groups also winter south of the Mexico-United States border. There is widespread concern about the future of NTMB (Andelman and Stock 1994), since many of these species have experienced large population declines due to habitat destruction on the breeding grounds, wintering areas and along migration routes.

There were sixty-six species listed as neotropical migratory bird species which were observed during the Service's study, or otherwise documented within the study area. In addition to riparian/wetland habitats, which is important for two-thirds of the NTMB within the study area, mesic shrub and shrub-steppe habitat are also important to several species.

Other Sensitive Bird Species- There is anecdotal evidence that common loons (*Gavia immer*), a candidate species for State listing, successfully bred in Devils Punch Bowl several years ago. During the Service's study, one loon in breeding plumage was observed in June; however, no further evidence of breeding was observed. Also, several loons were observed on the lake during September, but these could have been early migrants.

The American white pelican (*Pelecanus erythrorhynchos*) is listed as an endangered species by WDFW. Small numbers were observed using the south portion of the lake during spring and fall migrations.

### *Mammals-*

Thirty-four species of mammals have been documented as present within the study area according to past records. Threatened and endangered species present included the pygmy rabbit (*Sylvilagus idahoensis*), State-listed endangered and a Federal species of concern, Washington ground squirrel (*Spermophilus washingtoni*), a candidate species for Federal listing. In addition, five bat species which are Federal species of concern, are likely present in the area, but have not yet been documented.

Pygmy rabbits were the only mammals actively surveyed for by the Service in the study area, although time did not permit a complete and thorough search of the study area. Scat and burrows of the size used by pygmy rabbits or other species such as young Nuttall's cottontails (*Sylvilagus nuttalli*) were found in the study area. These observations are crucial considering the pygmy rabbit has been recently listed under the ESA. However, the Service was unable to positively confirm the presence of pygmy rabbits during these surveys of the study area.

### *Amphibians and Reptiles-*

Eleven species of amphibians and reptiles have been documented within the study area. Surveying suitable habitat in the spring, when toads and frogs are calling, would likely have resulted in more amphibian species observed. The only documented record of the Columbia spotted frog (*Rana luteiventris*), a Federal species of concern and a State candidate species, was in 1937. It was collected just east of Steamboat Rock at a stream which flows into Devils Punch Bowl. We would recommend future surveys especially if proposed activities may affect wetlands. Surveys may help reveal distribution and abundance of Columbia spotted frog.

### *Fishery Resources-*

Many of the fish species present in Banks Lake were pumped in from FDR Lake on the Columbia River. However, a few species originated in the small lakes that existed in the upper Grand Coulee prior to inundation and from the stocking programs carried out by state agencies. No official records were made of the fish fauna in these small lakes. Information from local fishermen indicated that before inundation, dense populations of largemouth bass (*Micropterus salmonides*) and pumpkinseed sunfish (*Lepomis gibbosus*) existed (Thomas 1978).

Shortly after inundation, a substantial population of largemouth bass developed as indicated by Washington Department of Game (WDG) catch records from 1952 through 1954 (Nelson 1954). Largemouth bass and sunfish dominated catches in these years and represented sixty-four and thirty-two percent of the catch, respectively (Nelson 1954). Yellow perch (*Perca flavescens*), rainbow trout (*Oncorhynchus mykiss*), eastern brook trout (*Salvelinus fontinalis*), kokanee salmon (*Oncorhynchus nerka*), black crappie (*Pomoxis nigromaculatus*), burbot (*Lota lota*), and bull trout (*Salvelinus confluentis*) were also identified in the 1952-1954 catches (Nelson 1954 and Spence 1965).

Irrigation water pumped from FDR Lake was the source of kokanee salmon, burbot, bull trout, and possibly rainbow and eastern brook trout sampled in early 1950's creel surveys. Black crappie may have been an early illegal introduction (Duff 1973). Only four bull trout were recorded in 1954 creel checks. With no available spawning habitat, bull trout never became established in the reservoir. Eastern brook trout also failed to establish a reproducing population and both species of char disappeared from catch and gill net survey data.

A gill net and beach seine survey conducted in Banks Lake between 1973 and 1975 found the following additional species for which there are no records of introduction: peamouth chub (*Mylocheilus caurinus*), northern pikeminnow (*Ptychocheilus oregonensis*), carp (*Cyprinus carpio*), longnose sucker (*Catostomus catostomus*), largescale sucker (*Catostomus macrocheilus*), bridgelip sucker (*Catostomus columbianus*), brown trout (*Salmo trutta*), mountain whitefish (*Prosopium williamsoni*), lake whitefish (*Coregonus clupeaformis*), brown bullhead (*Ictalurus nebulosis*), walleye (*Stizostedion vitreum*), bluegill sunfish (*Lepomis macrochirus*) and prickly sculpin (*Cottus asper*). Only one brown trout was sampled and suitable spawning habitat for the species does not exist in the system. With the exception of char, brown trout and rainbow trout, all of the other fish present in pre-reservoir lakes or drafted from FDR Lake were able to establish reproducing populations to various degrees.

Additional species which were found in Banks Lake after 1975 and/or are still present include yellow bullhead (*Ictalurus natalis*), white catfish (*Ictalurus catus*), channel catfish (*Ictalurus punctatus*) and smallmouth bass (*Micropterus dolomieu*). While the smallmouth bass were intentionally stocked, the others may have been illegally introduced.

The WDG (currently the WDFW), through continuous plants, developed substantial populations of rainbow trout (Thomas 1978). More irregular plants of kokanee have been made from the 1950's through the present. The Washington Department of Fisheries (currently the WDFW) planted coho salmon (*Oncorhynchus kisutch*) in 1971 and chinook salmon (*Oncorhynchus tshawytscha*) in 1974 and 1975. These introductions produced a brief fishery for chinook and coho salmon but plants were discontinued and no spawning habitat was available to establish naturally spawning populations.

Kokanee - Along with rainbow trout and perch, kokanee came to dominate the catch in Banks Lake during the 1960's through the 1970's. This fishery was supported primarily by beach spawning at five natural production areas around the lake shore (Duff 1973), with spawning success dependent upon fall-winter and spring reservoir levels (Thomas 1978). The kokanee fishery began to fail in the late 1970's and anglers ceased to target kokanee in the mid-1980's. Large plants of kokanee in the 1990's have failed to restore a targeted kokanee fishery in Banks Lake. Despite a barrier net at the outlet, significant numbers of small kokanee continue to be entrained downstream soon after stocking. This is evidenced by the catch of kokanee at unstocked Billy Clapp Reservoir, downstream from Banks Lake (WDFW 1997).

As the ecosystem in Banks Lake has matured, the original fertility of the lake has been changed by an increased biosystem complexity tying up much of the lake's nutrients. Average reservoir



outflow has increased 40 percent since the 1960's, reducing water retention time in the reservoir. Lower water retention times have further reduced fertility and reduced the availability of zooplankton. The present zooplankton biomass may be insufficient to support juvenile kokanee at the life stage normally stocked (WDFW 1996b). Since 1996, kokanee are reared in relatively small numbers to a larger size in net pens at Electric City and Coulee City before planting to address predation and food availability problems. A few anglers who still target kokanee report that kokanee fishing has improved since 1997 (Korth 1998).

Rainbow trout - With a catch of 20,170 in 1965, rainbow trout were one of the three dominant sport fisheries in Banks Lake during the 1960's (Spence 1965). A thirty-four percent decrease in the catch from the 1965 survey was noted during a 1971-72 survey (Duff 1973). To reduce predation on recently stocked juveniles, hatchery rainbows are raised to a larger size in net pens at Electric City and Coulee City before planting. This program increased returns to the fishery as rainbow trout are presently the dominant cold water sport fish in Banks Lake.

Lake whitefish - The introduction of lake whitefish into Banks Lake was apparently from FDR Lake. Lake whitefish first appeared in the catch in 1965 (Spence 1965). There is an abundance of shoreline habitat in Banks Lake suitable for spawning.

Yellow perch - The abundance of yellow perch was low during the early years of Banks Lake (Nelson 1954); however, since the 1960's, they have been the dominant fish by number in the Banks Lake catch. A high reproductive potential, coupled with flexibility in habitat and feeding requirements, have made them one of the most abundant species in the lake.

Largemouth bass - Largemouth bass dominated the Banks Lake fishery in the 1950's (Nelson, 1954). The largemouth bass fishery increased in both catch and intensity in the 1970's. The increased intensity of bass fishermen stemmed from rapid advances in bass fishing technology and the advent of several national bass fishing organizations (Zook 1978). Although largemouth bass numbers appear to be declining, it is difficult to determine the present trend in the Banks Lake largemouth bass population in the absence of accurate data (Foster 1998; Korth 1998). Increases in the carp population and a gradual loss of cover may have resulted in a decrease in bass fry survival.

Smallmouth bass - Smallmouth bass were introduced to Banks Lake in 1981 by WDG to increase species diversity and the number of bass available to anglers. Smallmouth utilize the steep littoral zone habitat prevalent in Banks Lake better than largemouth bass which, though widespread throughout the lake, are confined to preferred areas of shallow water habitat.

Walleye - Walleye became established in FDR Lake in the late 1960's. Fish drafted from FDR Lake were able to establish a reproducing walleye population in Banks Lake by the late 1960's (Duff 1973). Supplemental plants of walleye have been made infrequently since 1992 with the bulk of recruitment coming from natural reproduction.

Sunfish and crappie - During the warmer months of the year, crappie and sunfish provide a popular shore fishery. The large size of crappie at spawning indicates that the lake's population is probably relatively small. The pumpkinseed sunfish fishery peaks in August. Bluegill sunfish were probably illegally introduced into Banks Lake and very few are caught (Duff 1973).

Catfish and bullhead - Brown bullhead provide a limited fishery. They probably were part of the pre-stocking species composition of Banks Lake but may have been illegally introduced. White and channel catfish and yellow bullhead have also been reported in recent catches (Foster 1998) and are probably the result of illegal introductions.

Burbot - Large catches of burbot were made in the 1960's with some individuals creeling approximately 1,000 pounds per night (Duff 1973). The fishery rapidly diminished through the 1970's and burbot disappeared from the lake by the early 1980's (Bonar 1997). Over fishing, reduction of adult spawning stocks, slow growth, predation, and a temporary dip in prey numbers (lake whitefish) have been suggested as agents in the disappearance of burbot from Banks Lake (Duff 1973; Bonar 1997). An attempt was made in 1988 to reintroduce burbot to Banks Lake, but no fish were sampled or caught until fall 2000 and fall 2001 when WDFW sampling of Banks resulted in the appearance of burbot.

#### *Federally-Listed Threatened and Endangered Species-*

Bald eagle - Suitable habitat includes those areas that are close to water and provide a substantial food base such as along rivers containing anadromous fish, good populations of resident fish, abundant waterfowl and mammal populations. Bald eagles are often found along the shores of reservoirs and rivers. Territory size and configuration are influenced by availability of perch trees, quality of foraging habitat and distance of nests from water supporting adequate food supplies.

Bald eagles usually nest in the same territories each year and often use the same nests repeatedly (Anthony and Isaacs 1989). Nest trees typically provide an unobstructed view of an associated water body and are often situated in prominent locations. Snags, and trees with exposed lateral limbs or those with dead tops often occur in nesting territories and are used as roosts, perch sites or access points to and from the nest.

Bald eagle winter habitat is mostly associated with areas of open, ice-free water where fish are available and/or waterfowl congregate (Stalmaster 1987). Additionally, eagles may be scattered throughout upland areas feeding on ungulate carrion, game birds, and rabbits (Swenson et al. 1981). The majority of the bald eagles wintering in central and eastern Washington are migrants (Fielder 1992). Some move relatively short distances to lower elevations or inland for food sources. Most eagles that breed in the Pacific Recovery Area winter in the vicinity of their nests. As mentioned above, bald eagles have recently nested at two locations within the study area. Because of the large size of the communal roost, and the late dates that eagles were observed in the area, the potential exists for nesting attempts by additional eagles in the future. Recent nesting success was documented in 2001 at Banks Lake in which three active bald eagle nests produced surviving young.

There has been and will continue to be mature cottonwoods along the shoreline which are lost due to erosion. This erosion is especially prevalent on Steamboat Rock Peninsula. The RMP should ensure that a complement of mature cottonwoods are maintained along the Banks Lake shoreline and conditions are sufficient to provide for long-term propagation and growth to ensure presence of mature cottonwoods into the future.

Ute ladies'-tresses - This perennial orchid was listed as threatened in 1992. It was discovered in southeastern Idaho in 1996 along the upper Snake River and in 1997 in northern Washington. Ute ladies'-tresses (*Spiranthes diluvialis*) is typically found in wetland and riparian areas, including spring habitats, mesic to wet meadows, river meanders, and floodplains. This species may be adversely affected by habitat modifications associated with livestock grazing, vegetation removal, excavation, construction activities, stream channelization, and other actions that alter hydrology or vegetative cover. Potential habitat for this plant within the study area was surveyed in 1999. There was only a small amount of habitat found that could be used by this species and no Ute ladies'-tresses were found. Furthermore, commonly associated species, such as beaked spikerush (*Eleocharis rostellata*), were not found. Heavy grazing in riparian areas may have precluded the identification of this species. The most likely areas for this species include the two perennial streams which enter Banks Lake from the northwest, and some of the springs and seeps within the study area. Additional plant surveys should be conducted at these sites, in August or September, before activities are initiated which may potentially impact this plant.

Pygmy rabbit - Smallest of North American rabbits, pygmy rabbits are found in sagebrush-dominated areas and prefers areas with relatively deep, loose soil (WDFW 1995a). Within Washington, their range has been reduced to only five known isolated fragments of habitat in Douglas County. They are listed as endangered by WDFW. Surveys did not confirm presence of pygmy rabbits in the study area. Surveys should be done before future activities are allowed which could negatively affect shrub-steppe communities within the study area.

On November 30, 2001, the Service listed the Washington population of pygmy rabbit as endangered. This small population exists in Douglas County, and has declined dramatically over the past decade. The Service is working closely with the Washington Department of Fish and Wildlife (WDFW) in a captive breeding program to maintain some of the rabbits. The Service has also met with local farmer and ranchers to determine how they can help stabilize the population. A final listing decision will be published in late July 2002.

Western sage grouse - The western sage grouse (*Centrocercus urophasianus phaios*) is a large grouse that inhabits the shrub-steppe and meadow steppe regions of eastern Washington (Hays et al. 1998b). Suitable sage grouse habitat is typically sagebrush/bunchgrass stands having medium to high canopy cover with a diverse understory. They use sagebrush year round for food and cover, with a high forb use in summer. The drastic reduction in numbers and distribution of sage grouse in Washington is attributed primarily to loss and degradation of habitat (Hays et al. 1998b). They are now listed by WDFW as a threatened species. Although no known documented records of sage grouse existed within the study area, there are several records close

to the boundary and the study area for the recently-issued Banks Lake RMP fell within the current range of this species.

#### *Candidate Species-*

Washington ground squirrel - Washington ground squirrels (*Spermophilus washingtoni*) are found in steppe and open shrub-steppe, where it prefers deep, loose soil for digging burrows. It has been documented within the southeast portion of the study area several years in the past.

#### *Other Species of Concern-*

Black tern - Black terns (*Chlidonias niger*) are a relatively small tern which primarily eat insects. They occur statewide, in or near freshwater marshes, ponds, or lakes. Most breeding records are in the northeastern portion of the state, although there is a large colony on Goose Lake on the Colville Reservation and some colonies in Douglas County and Grant County. They usually nest in marshy wetlands in June; however, breeding records do not exist for the study area. They would most likely be found within the study area during spring and fall migrations.

California floater - This mussel is found in unpolluted fresh water, except small creeks. California floaters (*Anodonta californiensis*) prefer lakes and slow streams in areas less than 6.6 feet (2 m) deep and having sandy bottoms. Adults will also live on mud bottoms. Juveniles are parasitic on gills, fins and barbels of host fish. This species has not been documented at Banks Lake.

Columbian sharp-tailed grouse- This subspecies of sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) is the rarest of the six in North America and the only one found in Washington. It is listed as threatened by WDFW. They use a variety of habitats, including: shrub-steppe, grassland, mountain shrub, and deciduous riparian habitats. This species has declined substantially in numbers and distribution in Washington primarily because of loss and degradation of habitat (Hays et al. 1998a). This species has been documented in the past in Barker Canyon in or adjacent to the study area. There is some anecdotal evidence that they were also found in Norhtrup Canyon.

Columbia spotted frog - Columbia spotted frogs are found in warm water marshes, overflow wetlands, and bogs with non-woody wetland vegetation. They occur scattered across most of eastern Washington and have been documented within the study area.

Fringed myotis - Fringed myotis (*Myotis thysanodes*) is a bat which is associated with arid forest, desert, and arid grassland, especially near riparian areas. It roosts in caves, mines, rock crevices, and buildings. While this species has not been documented at Banks Lake, there are several recent records in similar habitat west of Banks Lake in Moses Coulee.

Loggerhead shrike - Loggerhead shrikes (*Lanius ludovicianus*) are robin-sized birds which feed primarily on insects, with small birds and mammals taken in winter. Preferred habitat includes shrub-steppe and any semi-open area with shrubs, fences, power lines or small trees for perches.

Six loggerhead shrikes were observed in the study area during 1998 breeding season surveys.

Long-eared myotis - The long-eared myotis (*Myotis evotis*) is more of a forest dweller which roosts in trees, buildings, and rock crevices. It forages over and around trees, and near water courses in arid regions. This species has not been documented at Banks Lake but would likely occur.

Northern sagebrush lizard - The northern sagebrush lizard (*Sceloporus graciosus graciosus*) is primarily a shrub-steppe dweller, but also uses bouldered regions and forested slopes. They are typically a ground lizard and rarely climb into shrubs. They prefer fine gravel soils, but also occur on sandy or rocky soil. They require rock crevices, mammal holes or similar cover for refuge. This species has not been documented at Banks Lake.

Olive-sided flycatcher - The olive-sided flycatcher (*Contopus borealis*) seems to prefer mixed and broken forests with wooded streams and some wetland. The diet consists entirely of flying insects which they search for from high snags and perches. They typically nest high in conifer trees and would most likely be found in Northrup Canyon.

Pale Townsend's big-eared bat - Pale Townsend's big-eared bat (*Plecotus townsendii pallescens*) occurs in a variety of habitats from grasslands to forested areas. It roosts in trees, building, and caves and is one of the few bats in Washington which forages more in upland areas than over water or in riparian habitat (Johnson and Cassidy 1997). While this species has not been documented at Banks Lake, there are several recent records in similar habitat west of Banks Lake in Moses Coulee.

Petrophyton cinerascens - (Chelan rockmat) - This plant is a local endemic known only from recent records in Douglas and Chelan counties (WNHP 1997). While the records have all been along basalt cliffs and bluffs along the Columbia River, the basalt cliffs in the study area may also provide suitable habitat.

Phacelia lenta (sticky phacelia) - This plant is a local endemic known only from recent records in Douglas County (WNHP 1981, 1997). While the records have all been along the basalt cliffs of the Columbia River, the basalt cliffs in the study area may also provide suitable habitat.

Small-footed myotis - The small-footed myotis (*Myotis ciliolabrum*) occurs in open, arid areas and commonly forages around cliffs, rock outcrops, and dry canyons (Johnson and Cassidy 1997). It roosts in cavities in cliffs, vertical banks, the ground, talus slopes, and under rocks. While this species has not been documented at Banks Lake, there are several recent records in similar habitat west of Banks Lake in Moses Coulee and it likely occurs here.

Western burrowing owl - The western burrowing owl (*Athene cunicularia hypugea*) is generally found in open, broken or flat areas, including shrub-steppe and agricultural areas. An opportunistic feeder, it preys primarily on insects and small mammals, but also birds, fishes and amphibians, when available. They use ground squirrel or other mammal burrows for shelter and

nesting. This species has not been documented at Banks Lake.

Yuma myotis - Yuma myotis (*Myotis yumanensis*) is a bat that occurs in forested areas, forest edge, and open areas such as arid grasslands. It is more closely associated with open water than any other Washington bat (Johnson and Cassidy 1997). It roosts in caves, trees, and buildings. A large night roost (1,000 +) of this species has been identified within the study area near Northrup Creek.

#### *Wildlife Habitat-*

The Banks Lake RMP study area consists of a diversity of habitat types. Shrub-steppe is dominant across the landscape. Other habitat associations include rock/talus slopes, mesic shrub, wetland/riparian, grasslands, and occasionally forest. Much of the following information on habitat was found in the Service's Planning Aid Memorandums for the Banks Lake RMP (1998 and 1999). More detailed information on habitat can be found in those documents.

Shrub-steppe - Shrub-steppe is the climax upland habitat association over the majority of the study area. Three types of shrub-steppe were present, possibly dependent on soil depth and salinity. Typically, big sagebrush (*Artemisia tridentata*) communities occurs on deeper soils and were the dominant shrub-steppe association over the study area. Stiff sagebrush (*Artemisia rigida*) is the dominant shrub on shallow and rocky soils. Shrub-steppe on saline soils is dominated by greasewood (*Sarcobatus vermiculatus*) and inland saltgrass (*Distichlis stricta*).

There were some NTMB observed during the Service's studies or otherwise documented, which prefer, or at least commonly use, shrub-steppe habitat for breeding. Some of these include long-billed curlew (*Numenius americanus*), loggerhead shrike, Brewer's sparrow (*Spizella breweri*), and sage thrasher (*Oreoscoptes montanus*). While breeding was not documented, all species were observed within the study area during the normal breeding season.

Aside from NTMB, several other bird species documented in the study area use shrub-steppe habitat for nesting and foraging. Some of these bird species include: dabbling ducks for nesting; raptors preying on species found in shrub-steppe; upland game birds using this habitat for cover; aerial insectivores, such as white-throated swift, swallows, and common nighthawk, feeding above this habitat; and, several passerine species such as, northern shrike (*Lanius excubitor*), and song sparrow using this habitat for nesting. Other species found in this habitat included furbearers, small mammals, Nuttall's cottontail, porcupine (*Erethizon dorsatum*), and some amphibians and reptiles.

The presence of several shrub-steppe dependent bird species, NTMB species, and use by many other birds; several mammal species, and amphibians and reptiles, indicates that at least some of the shrub-steppe habitat in the study area is in good condition. Unfortunately, shrub-steppe habitat in the Columbia Basin has suffered significant reduction from conversion to agriculture, overgrazing and other factors (Dobler et al. 1996). This has helped reduce distributions and populations of several wildlife species, causing many to receive special designations from WDFW

and the Service because of their rarity. In addition, the GAP analysis of Washington State (Cassidy et al. 1997) found that the largest gap in the protection of biodiversity in Washington is in the shrub-steppe zone. Updating the GIS work that was done at Banks Lake would be valuable.

Much of the original shrub-steppe habitat adjacent to the study area has been converted to irrigated or dry croplands. Many native wildlife species occupying the Columbia Plateau have been declining over the past three decades due to the loss of habitat caused by intensified farming, burning, herbicide spraying, and livestock overgrazing. Where agricultural areas are interspersed with native shrub-steppe, riparian/wetland areas, or with uncultivated lands, they provide habitat for introduced game birds such as ring-necked pheasant (*Phasianus colchicus*), California quail (*Callipepla californica*), chukar (*Alectoris chukar*), and wild turkey (*Meleagris gallopavo*).

Shrub-steppe species with no documented presence in the study area, such as western sage grouse or sharptail grouse, could benefit if larger blocks of good quality shrub-steppe habitat were present in the area. There are several records of this species near the study area boundary and with improvements in habitat they may begin using the study area.

The better quality shrub-steppe habitat (such as that present at the ORV area) needs to be protected to ensure it is maintained or even improved over time. These areas often have few non-native plant species present and have an intact cryptogamic crust on the soil. Overgrazing, fire, indiscriminate motorized travel and other activities could have an adverse affect on these areas.

Grasslands - Grasslands are uncommon on the study area and are generally the early successional phase of shrub-steppe. Some grassland areas showed evidence of recent fire and contained young shrubs. We defined grasslands as those areas containing less than five percent shrub cover. Typical native grasslands contained bluebunch wheatgrass (*Agropyron spicatum*), needle-and-thread (*Stipa comata*), along with cheatgrass (*Bromus tectorum*). Many areas identified as grassland more closely resembled weedy fields with several weedy forbs dominant and plant diversity relatively low.

Wetland/Riparian areas - Wetland and riparian areas are common along the lakeshore; frequently are found in low depressions within upland areas; and are associated with springs, seeps, and perennial streams. Wetland/riparian types include ponds, perennial wetlands, seasonal wetlands, nonforested riparian, and forested riparian areas. There are some unique vernal pool wetlands on top of Castle Rock. There are also some marshes along the shoreline which are dominated by bulrush (*Scirpus sp.*) and cattail (*Typha*). Those marshes at Devils Punch Bowl and Osborn Bay are heavily used by waterfowl, and other waterbirds, such as colonies of western grebes. The riparian/wetland areas within the study area are important habitats to several species of wildlife including waterfowl, shorebirds, common snipe (*Gallinago gallinago*), some raptors, many passerines such as yellow warbler (*Dendroica petechia*), and amphibians. Aside from providing essential habitat for some species which must have riparian and/or wetland areas, they also provide drinking water, food (i.e. submergent, aquatic plants and macro-invertebrate forage resources for fish species), and cover for many terrestrial wildlife species including muskrat, beaver, mink, and raccoon.

Spring and seep areas are dispersed throughout the Banks Lake area. The larger ones, such as Behne Springs and some near the northern border of the study area, together with their associated riparian plant community, provide surface water, cover, and forage for many wildlife species including NTMB, raptors, game birds, deer, and small mammals. The two perennial streams which enter the northwest portion of the study area provide important habitat and corridors. Unfortunately, cattle attracted to the year-round water sources, have negatively impacted these habitats through overgrazing and trampling.

Riparian areas are estimated to provide less than one percent of the land base in the Pacific Northwest yet support the greatest diversity and abundance of wildlife that exist in the arid portions of the region (USFWS 1990). WDFW (1995b) states that about 90 percent of Washington's land-based vertebrate species use riparian habitat for essential life activities. They point out that the high wildlife value of these areas is derived from the structural complexity of vegetation, connectivity with other ecosystems, high edge-to-area ratio, abundant food, water and a moist and mild microclimate. Unfortunately, quality riparian habitat has become relatively rare in the Columbia Basin due to arid conditions and land use activities such as grazing, conversion to cropland, and the inundation of lands by reservoirs. Since that inundation at Banks Lake, willow and black cottonwood areas have developed along the margin of Banks Lake and below Dry Falls Dam.

The timing and magnitude of reservoir fluctuations and drawdowns can impact the development of wetland and riparian vegetation along the lake margin in addition to the submergent, aquatic plant and aquatic invertebrate components. The maintenance of reservoir levels at or near full pool elevations during the winter season may have accelerated the loss of mature riparian cottonwoods and willows regularly used by roosting bald eagles and other raptors. The loss of this riparian component may primarily be the result of shoreline undercutting and erosion by wave action when the reservoir is at or near full pool.

Forested areas- Forested or mature conifer areas are uncommon overall, although several forest types occur within the study area. Upland forested areas include a granitic canyon located in the northeast part of Osborn Bay. This area is dominated by Douglas-fir (*Pseudotsuga menziesii*) and in lesser amounts by ponderosa pine (*Pinus ponderosa*), chokecherry, mockorange (*Philadelphus lewisii*), rose (*Rosa sp.*), serviceberry (*Amelanchier alnifolia*), and bluebunch wheatgrass. The north slope of Castle Rock is forested by second growth ponderosa pine and Douglas-fir. These stands are best developed at the base of long, basalt talus slopes. The forest grades abruptly into shrub-steppe. Other small areas of forest are found in association with the granitic islands and rock outcrops found in the vicinity of Devils Punch Bowl, Kruk's Bay, Eagle Rock, Jones Bay, and Lovers Lane. Furthermore, scattered throughout the upper reservoir's hummocky granitic islands and rock outcrops are individual ponderosa pine, Douglas-fir, and quaking aspen (*Populus tremuloides*) trees. The forested areas are generally not dense enough or occur in such small patches that they would not support substantial populations of some woodland wildlife (for example, black bear). However, they do provide habitat for raptors, NTMB, and numerous other non-game birds and small mammals.



Some unique forested areas within the study area consisted of quaking aspen dominated groves with a high diversity of shrub and forb species. These quaking aspen groves are associated with some water source such as springs or runoff at the base of talus slopes. Understory species in quaking aspen groves closely resemble those found in mesic shrub areas. Quaking aspen communities are not particularly characteristic of the shrub-steppe (Franklin and Dyrness 1973) and are recognized as Priority Habitats by WDFW. In addition to quaking aspen, the areas contain a diversity of deciduous tree and shrub species which are important to wildlife for food and cover. Mule deer use these areas heavily. Songbird species will nest in these areas or make use of them as migratory stopovers for feeding or roosting, particularly NTMB. Quaking aspen groves are susceptible to disturbance and alteration, especially from grazing, because of their proximity to water sources.

Finally, there are some small groves of Russian olive (*Elaeagnus angustifolia*) trees at several locations within the study area. These were probably the results of earlier plantings and they do not appear to spreading as they do very rapidly in other parts of the Columbia Basin. Although they are non-native species and rapidly displace native species in some locations, they are providing some valuable habitat in the study area. They are used by some NTMB, game birds, raptors including numerous nesting pairs of long-eared owls, deer, and small mammals. Unfortunately, several of these groves of trees are used as dispersed camping areas, which would disturb many of the species that would be using that habitat.

Cliffs/Talus/Mesic Shrub - Rock and talus slopes are very common throughout the Banks Lake area comprising the walls of the Grand Coulee. Scattered areas of sparse vegetation occurred on these slopes, ranging from grasses and forbs to shrub species. Mesic shrub habitat is common at the base of the talus, probably associated with areas of run-off or seeps. Mesic shrub areas are typically small in size but high in plant diversity. Most of the mesic shrub areas are relatively free from adverse impacts from human activities or grazing, since they are often on rugged terrain associated with the cliffs and talus slopes.

The basalt cliffs and talus slopes are habitat to several species of wildlife, including a high diversity of raptors, white-throated swifts (*Aeronautes saxatalis*), swallows, Say's phoebe (*Sayornis saya*), and reptiles. Because of the steepness and ruggedness of these areas, there are few recreational activities or management measures which could affect these habitats.

Rock-climbing is an activity which does occur within the study area and which can affect species using these habitats (for example, peregrine falcon, other raptors, white-throated swift colonies, etc.). A rock-climbing management plan should be developed which provides adequate protection to important resources. At a minimum, it should guide activities away from important nesting areas during the spring and early summer.

Noxious weeds - Noxious weeds are a common problem in the study area and generally invade and occupy sites that have been previously disturbed by fire, livestock grazing, motorized travel, and/or dispersed camping. In Washington, a weed is any plant species that is not native to the state with the exception of agricultural crops (i.e. corn, onions, and grapes). Weeds typically interfere with the maintenance of healthy and diverse ecosystems. Consequently, weed control is

an integral part of resource management as non-natives can displace native plant species and are often of lower forage value to wildlife and difficult to extirpate once established. Other wildlife requisites, such as cover and nesting habitat, are also affected by the replacement of native plants by weedy species.

Cheatgrass, the most common weed found in the study area, has invaded many areas where native perennials have been overused and/or eliminated. There is little evidence that cheatgrass will relinquish a site once occupied due to its highly competitive ability. Other common noxious weeds include diffuse and spotted knapweed (*Centaurea diffusa* and *biebersteinii*, respectively), Canada thistle (*Cirsium arvense*), pepperweed (*Lepidium latifolium*), kochia (*Kochia scoparia*), Dalmatian toadflax (*Linaria dalmatica* spp. *dalmatica*), Russian knapweed (*Acroptilon repens*) and purple loosestrife (*Lythrum salicaria*). Cheatgrass, knapweeds, and Canada thistle currently are the most prolific weeds present at Banks Lake.

The proliferation of these undesirable plants is controlled through the implementation of an integrated weed management program between Reclamation, the State of Washington, and the Noxious Weed Control Boards of Douglas and Grant counties. At Banks Lake, the WDFW is responsible for weed control. The main weed control activity currently is helicopter spraying of 2,4-D on Canada thistle.

Eurasian watermilfoil (*Myriophyllum spicatum*) is a rooted, submersed aquatic macrophyte native to Europe, Africa, and Asia. An aquatic weed first found in Banks Lake in 1977, it has no natural enemies in North America and often outcompetes native plants, forming dense mats which may cause problems in swimming, boating, fishing, navigation, and power generation. When detached and transported by waves or currents to shorelines, it decays and causes appearance and odor problems.

A 1980 BOR survey found it widespread wherever there was suitable substrate for rooting. In some areas it became the dominant aquatic species, and a few plants were found at 18-20 feet of water. A number of milfoil control measures and management techniques involving water level manipulation, mechanical control, herbicides, biological controls, and light-screening measures have been reviewed and considered by BOR. One or some combination of these may be the most effective, although complete eradication does not appear to be practical. "Control" measures should avoid action detrimental to desirable submergent, aquatic plants.

## **Description of Alternatives**

Information on the proposed Banks Lake 10-foot drawdown alternatives was obtained from BOR staff in the Ephrata, WA office. Currently, the BOR has two alternatives to address the goals and objectives agreed to for the Banks Lake drawdown. In addition, the "No Action" Alternative (Alternative A) includes the actions and developments likely to occur in the absence of adopting and implementing a drawdown for Banks Lake. Many of these actions are either required to meet existing BOR or federal law, policy, or regulations; state or local regulations; or are authorized by existing management plans or state policies in effect at Banks Lake. These actions are common to all of the alternatives. A sampling of some of these actions include:

Banks Lake is affected by two Reasonable and Prudent Alternatives (RPA) from the 2000 FCRPS Biological Opinion (BO) issued by the National Marine Fisheries Service (NMFS). These are RPA 23 which requires the operation of Banks Lake up to 5 feet below full (from elevation 1570 feet to 1565 feet) during the month of August and RPA 31 which requires a study to determine the effects of operating Banks Lake up to 10 feet below full pool during the month of August. All operations and RPAs have a goal of increased flows in the Columbia River to assist in the outmigration of salmonids.

No-Action Alternative (Alternative A):

- Banks Lake can be operated for multiple uses throughout the top five feet (1570 feet to 1565 feet) of its operating range in August. For the purposes of Columbia River flow augmentation, it is most likely that it would start at or near full pool on August 1 and draft to elevation 1565 feet per one of the following strategies (Appendix B):
  - Early draft – pumping ceases on August 1 and irrigation demand drafts Banks Lake to elevation 1565 feet in about 10 days (most likely when McNary flow targets are not being met in early August).
  - Late draft – pumping ceases on August 20 and irrigation demand drafts Banks Lake to elevation 1565 feet by August 31 (most likely when McNary flow targets are being exceeded in early August)
  - Uniform draft – pumping is scheduled to draft Banks uniformly from August 1 to August 31 (most likely in near-average water years).

Action Alternative (Alternative B):

- Banks Lake can be operated for multiple uses throughout the top 10 feet (1570 feet to 1560 feet) of its operating range in August. For the purposes of Columbia River flow augmentation, it is most likely that it would start at or near full on August 1 and draft to elevation 1565 feet per one of the following strategies (Appendix B):
  - Early draft – pumping ceases on August 1 and irrigation demand drafts Banks Lake to elevation 1560 feet in about 18 days (most likely when McNary flow targets are not being met in early August).
  - Late draft – pumping ceases on or about August 12 and irrigation demand drafts Banks Lake to elevation 1560 feet by August 31 (most likely when McNary flow targets are being exceeded in early August).
  - Uniform draft – pumping is scheduled to draft Banks uniformly from August 1 to August 31 (most likely in near-average water years).

It is anticipated that refill of Banks Lake to elevation 1565 could happen over the Labor Day holiday for each alternative which would vary from one to seven days after August 31. Refill would take several days and water not pumped during the holiday would be slowly replaced with a target of refilling to 1565 ft. by October 1.

All alternatives and accompanying drafting configurations are described this way to allow the maximum of freedom for the operators to provide water to the river when it is most needed to support the goals of NMFS. Also, predicting the exact operating schedule for Banks Lake is impossible as each year will have a unique set of conditions that will help to dictate the operations for that year.

### **Fish and Wildlife Resources without the Proposed Ten-Foot Drawdown**

In this section, we discuss proposed changes to fish and wildlife and their habitats in a one year period (time-frame the drawdown/flow augmentation would cover) if the proposed 10-foot drawdown was not to take place, that is, following the “No-Action” Alternative A. As noted above, there would be several proposed changes to current management of the Banks Lake area through the current Banks Lake Resource Management Plan (Banks Lake RMP) even without the implementation of a 10-foot drawdown. For example, fish and wildlife habitats would be enhanced, dispersed camping in environmentally sensitive areas would be controlled or eliminated, grazing would be monitored and modified accordingly, the informal shooting range would be closed and a new recreation area would be developed just south of Steamboat Rock. These future actions would result in improved habitat conditions and reduced disturbance to some species in Banks Lake, but secondary effects to species (i.e. salmonids) within the mainstem Columbia River would not be as beneficial without the 10-foot drawdown.

#### *Fisheries-*

It appears that fishery habitat for many species should continue to improve over time at Banks Lake. Many of the actions included under the “No-Action” Alternative (Alternative A) could actually improve present conditions for fish. For example, one of the actions would be to enhance fish and wildlife habitats within the immediate Banks Lake ecosystem. This would partially be satisfied by a proposed long-term fishery enhancement project that is currently being proposed by the Washington State Bass Federation. It would result in construction of deepwater reefs and shoreline restoration projects such as using vegetation, rock and/or small wood. Providing additional habitat would benefit several fish species. Additional management changes (such as adjustments to grazing plans) and enhancements (such as reducing recreation impacts in sensitive areas) which are related more directly to wildlife and wildlife habitats, could provide indirect benefits to fishery resources. These enhancements are all subject to available people and money.

However, supplemental flows to aid the migration of juvenile salmonids in the mainstem Columbia River would not be available if the “No-Action” Alternative A was selected. This augmentation to Columbia River flows would contribute to seasonal releases of water from upstream dams which aid in the outmigration process. Salmon evolved under spring flooding conditions which helped carry young fish to the sea. Storage dams hold back water, for flood control and other

uses, interrupting the seasonal peaks in the hydrograph. Some studies indicate that travel time of juvenile salmon increases significantly in the Snake River as water flows decrease, and that survival increases as flows increase. Until recently, water levels in the Columbia River have not been determined by needs of the endangered salmonids, but by demand for power, irrigation, water, and flood control.

As mentioned previously, Eurasian watermilfoil control in Banks has involved an infrequent 25-foot drawdown of the lake during winter. Large drawdowns cause adverse impacts to fish habitat in shallow shoreline areas and on the fish populations which depend on this habitat for food and cover. Continuing to use these severe drawdowns every 10 years or so could cause periodic adverse impacts to some fish populations. If other control measures are used, such as spot herbicides or less severe drawdowns, adverse impacts to fishery resources could be less severe. These impacts would not materialize if a “No-Action” Alternative A was selected.

In recent years, personal watercraft (PWC) use has increased significantly and will likely continue to increase at Banks Lake. PWC use in shallow areas during the spawning season potentially reduces the spawning success of nesting fish, therefore, increased use of PWCs in the future would likely continue to impact some fish spawning.

#### *Wildlife-*

In the future, it is anticipated that recreational use at Banks Lake would continue to increase if Alternative A was the chosen alternative. This would likely cause at least minor adverse impacts to wildlife and their habitats, depending on how the use is monitored and regulated. Currently, there is dispersed recreation and indiscriminate motorized travel within close proximity of the study area. Depending on the time of year and the habitat impacted, this could have significant adverse impacts to wildlife. For example, dispersed camping at some of the Russian-olive thickets could seriously disturb nesting birds and use of the trees as thermal cover for deer. In the winter, this camping could disturb bald eagles and prevent them from using favored perch sites (i.e. Steamboat Rock nesting site). Off-road vehicle (ORV) use and indiscriminate motorized travel has caused habitat fragmentation throughout and allowed weeds to gain an advantage, especially in shrub-steppe and grassland areas. Also, it has promoted erosion in some areas.

Grazing impacts have occurred throughout the study area from both permitted and trespass grazing. Impacts are primarily from over-grazing and trampling of vegetation and compaction of soils. Aside from direct loss of habitat, this allows weeds to proliferate. Impacts are particularly noticeable in riparian areas, at seeps and springs, and in some shrub-steppe areas. The persistence of grazing impacts and other management-related impacts to wildlife and scarcity of wildlife habitat improvement projects at Banks Lake is at least partially because a management plan for the Banks Lake unit had not yet been finalized by WDFW until recent years through the Banks Lake RMP. Since a plan has been completed, benefits to wildlife could be significant.

Impacts to wildlife and their habitats could occur in the future from various developments. For example, there are proposals to increase developed recreation facilities, including two new campgrounds just south of Steamboat Rock. Unfortunately, campgrounds in these areas would

impact some high quality shrub-steppe (along with associated species) and could also impact several cliff-dwelling species (for example, prairie falcons, golden eagles, and several sensitive bat species). However, if developed facilities are placed in areas with low to fair habitat quality and are not near sensitive areas, they could have very low potential impacts to wildlife or their habitats along the fringes of Banks Lake.

Various management actions could be implemented under the proposed Banks Lake RMP if the “No-Action” Alternative A is selected and these would include enhancing fish and wildlife habitat; emphasizing weed control efforts in areas with high wildlife habitat value; controlling dispersed camping, indiscriminate ORV use, and motorized road travel in environmentally sensitive areas; and monitoring grazing and modifying permits and plans accordingly. Plans for improving signage and interpretive opportunities as well as enhancing “Watchable Wildlife” viewing opportunities could improve wildlife and their habitats by helping the public to better appreciate their value. Also, helping them understand current regulations better could reduce actions which degrade habitats or disturb wildlife. Finally, opportunities to generate additional revenue for reservoir area operation, maintenance, and management will be sought in the future. This would be a real benefit since it appears that WDFW has relatively few funds that are dedicated to improving and enhancing wildlife habitat at Banks Lake.

### **Future of Resources with the Proposed 10-foot Drawdown**

Within the “Action” Alternative B, there are several drafting strategies or configurations for the proposed drawdown. All of these strategies focus on one common objective, flow augmentation in the Columbia River. Therefore, this CAR does not address the potential adverse or beneficial impacts from each strategy (i.e. early draft, late draft, etc.) included in the “Action” Alternative B. Instead, it focuses on potential impacts of the action as a whole, with discussions on specific issues and actions of concern.

As mentioned earlier, the future with “No Action” Alternative A (future without a drawdown) could result in select net benefits to fish and wildlife resources above current conditions. All of the management actions that would coincide with Alternative A would be implemented under the current Banks Lake RMP with only slight variations. Where these actions are not included within a particular Banks Lake RMP recommendation, an action is usually proposed that is even more protective of fish and wildlife resources. For example, where “No Action” Alternative A includes a strategy to monitor grazing and modify permits and plans through the Banks Lake RMP, “Action” Alternatives B would include suggested, but not required, mitigative recommendations/measures that would enhance fishery resources within the immediate Banks Lake project area. In addition, there are some actions that are not addressed in the “No-Action” Alternative A which would be implemented with each of the Banks Lake RMP recommendations thereby creating additional benefits to fish and wildlife resources.

### *Fisheries-*

The fisheries ecosystem of Banks and Columbia River would be affected in several ways under the drawdown “Action” Alternative B. First of all, the Washington Department of Fish and Wildlife

operates a series of fish net-pens along the north and south shores along Banks Lake (pers. comm. Korth 2001). A drawdown, as proposed in the “Action” Alternative B, would be render this operation useless due to low water levels in Banks Lake. If a drawdown was approved and implemented according to the “Action” Alternative B, the operation of these pens could potentially be delayed during the timeframe of operation which is typically from October to June due to the resulting lowered lake level.

Secondly, ideal rearing habitat for respective fish species would be vastly reduced in the event of a 10-foot drawdown. Osborn Bay of Banks Lake would be one specific area of concern where access to spawning habitat would be a limiting factor. The vegetative structure and shallow-water habitat that rearing fish need for foraging and predator protection would also be reduced. Typically, a minimal forage base exists when fish species are forced to migrate from shoreline habitat and productive littoral zones to the interior of the reservoir where the abundance of forage resources and protective habitats are vastly lower (Korth, pers. comm. 2001). If a drawdown was to be enacted, a corresponding increase in the level of predation on fish species would be a primary effect of the drawdown.

Among the desired effects of the drawdown is control of Eurasian water milfoil. When milfoil occurs in large amounts, it results in degradation of the abundance and diversity of invertebrates needed for fish species due to reduced dissolved-oxygen levels from decaying vegetation. Along with milfoil, it is expected that several other species of aquatic vegetation will die back. These species include *Potomageton pectinatus*, *P. nodosus*, *P. crispus*, *Elodea canadensis*, *Ceratophyllum demersum*, *Lemna minor*, *Typha spp.*, and *Scriipus spp.* Past experience with drawdowns show that all vegetation is somewhat susceptible to damage from exposure, but the native species appear to recover more rapidly than the introduced species (Banks Lake Resource Management Plan, March 2001). This allows the natives to reestablish themselves before the milfoil which increases the competition against milfoil for several years. This also increases the species diversity which should increase the diversity of other species dependent on the plants for food and shelter over the long term. Establishment of these native submergent, aquatic plant species is critical considering various wildlife species (i.e. waterfowl) at Banks Lake rely on this food resource.

As stated above, Columbia River flows and ESA listed salmonid stocks (i.e. spring and summer out-migration) would be positively influenced if the “Action” Alternative B was the preferred alternative.

#### *Wildlife-*

Current wildlife management actions proposed under the Banks Lake RMP involve seasonally or permanently closing some roads and dispersed camping in some sensitive areas. Additional actions involve discouraging use of nesting islands and other sensitive areas either seasonally or permanently and modifying the bald eagle management plan. Many of the management actions being considered could provide some benefit to wildlife, primarily through reducing human disturbance factors at critical times of the year for some species. It is predicted that wildlife impacts along the fringe habitat of Banks Lake would be reduced because of lowered recreational

use if “Action” Alternative B is selected. There would be some reduction in the habitat degradation that occurs with dispersed camping and other recreation activities. However, habitat degradation could extend to the localized small mammal populations (i.e. beaver and muskrat) as well as bat populations that rely on wetland habitat and invertebrate prey species which originate along the riparian fringe of Banks Lake. The proposed drawdown would significantly reduce this type of habitat and associated food resources.

More specific wildlife concerns resulting from the 10-foot drawdown would predominantly focus around migratory and nesting pairs of bald eagles at Banks Lake. Migratory eagles rely heavily on the migratory and resident waterfowl populations at Banks Lake as a food resource whereas nesting pairs tend to utilize the resident fish species in Banks as the main component of their diets. The proposed drawdown has the potential to limit food resources for nesting pairs, however, bald eagle young of the year would be approaching the fledgling state by the time the drawdown would take effect, thereby limiting significant or obvious impacts to natural reproduction of these eagles. Although, human use (i.e. wildlife observation) could increase with the advent of easier access to view nesting sites around the riparian habitat of Banks Lake (i.e. Steamboat Rock nesting site).

#### *Recreation-*

Each of the proposed alternatives include actions which would reduce access to frequently-used boat ramps along Banks Lake thereby reducing revenue input into the local economy. One of these popular sites where boating accessibility is important to the local community is Coulee Playland State Park. Moorage around the lake at specified sites would also be affected due to the drafting strategies proposed for this drawdown. This type of local economic impact was evident during the summer of 2001 when Banks Lake was lowered five feet for irrigation purposes as well as Columbia River flow augmentation.

#### *Land Use and Administration-*

The main adverse impacts from actions under Land Use and Administration (via the current Banks Lake RMP) would be from disposing or leasing of project lands to private entities. With these proposals, current wildlife habitat could potentially be eliminated on those parcels (120 acres). The magnitude of the impact would depend on the current habitat present, some of which includes wetlands. While 360 acres is proposed to be transferred to BLM, this property would likely be managed the same or similar to current conditions.

### **Recommendations**

- Some mitigation actions for various adverse impacts (existing and potential future impacts) could include the establishment of native riparian vegetation in various areas of the drawdown zone, such as native bunchgrasses and forbs in shrub-steppe and riparian vegetation along the shorelines. The limited timeframe of this drawdown may limit the logistical feasibility of this mitigation.
- The BOR should designate a minimum operating level for Banks that allows for feasible



operation of net-pen operations at the north and south ends of Banks Lake.

- Funding should be provided for improvement of existing net pens, including structures to eliminate depredation by birds if “Action” Alternative B is selected.
- If the 10-foot drawdown is implemented, the BOR should ensure timely refill of Banks Lake up to 1565 feet by early September to ensure operation of net-pens.
- If 10-foot drawdown is extended into the early spring season of 2003, the BOR shall ensure that both net-pen operations at the north and south ends of Banks Lake will be moved to an ideal operation location before September 2002.
- The BOR shall work collaboratively with WDFW and the Service to develop studies that would examine the effects or lack of effects of the proposed drawdown on rearing fish species in Banks Lake.
- The Service recommends the BOR to develop a short-term plan that would address potential modifications of current boat ramp and moorage facilities in order to facilitate summer use activities.
- The high value of the Devils Punch Bowl area to several migratory bird species and the close proximity of a significant amount of recreation pressure undoubtedly leads to adverse impacts to sensitive habitats and disturbance to these species. Actions should be included, for the “No Action” and “Action” alternatives, that provide some level of protection to species using this area, at least during nesting and rearing seasons.
- The BOR should ensure that a complement of riparian vegetation be maintained along the Banks Lake drawdown zone and that conditions should be sufficient to provide for short-term input of nutrients into the water column as Banks Lake approaches its refill goal.
- A study to determine the reproductive success of western grebes in the study area should be initiated to help determine the level of management that should be applied to protect these birds in light of the proposed drawdown.
- Surveys for pygmy rabbits should be done in specific areas within shrub-steppe communities to address the potential of increased public use that has been diverted away from Banks Lake due to the drawdown.
- Restrictions on the use of PWC during fish spawning seasons in certain areas could benefit several fish species where spawning habitat has become limited due to the proposed drawdown.
- Hatchery compensation via the WDFW is an option that the BOR should pursue if lack of recruitment for certain fish populations is linked to the proposed drawdown.

- Impacts of the several fishing tournaments at Banks Lake on fisheries should be determined and tournaments modified or curtailed, if necessary to facilitate spawning events.
- Protection of habitat, such as shrub-steppe, from fire is important, in this arid region since it does not recover quickly from fire. Attempts should be made to ensure shoreline access to water resources in the event of uncontrolled wildfire in these designated shrub-steppe areas.
- Additional Ute ladies'-tresses surveys should be conducted at the two perennial streams which enter Banks Lake from the northwest and some of the springs and seeps within the immediate vicinity to determine potential impacts to this plant from the proposed drawdown.
- Updating the GIS work that was done at Banks Lake by the BOR would be valuable. Aside from changes that will occur over time, this would allow some of the errors the Service identified in its 1998 Planning Aid Memorandum (U.S. Fish and Wildlife Service 1998) to be corrected and a more accurate vegetation map to be generated to determine potential wetland impacts linked to the drawdown and concurrent management actions.
- The BOR should use all available techniques to eliminate water milfoil if proposed drawdown is implemented. Do not use control methods that would result in negative impacts to desirable submergent, aquatic plants and aquatic invertebrates.
- The BOR should initiate studies to examine the potential effects of the drawdown on wildlife species.

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## Appendix A

Letter of Concurrence from Washington Department of Fish and Wildlife

Letter of concurrence from Washington Department of Fish and Wildlife not received.

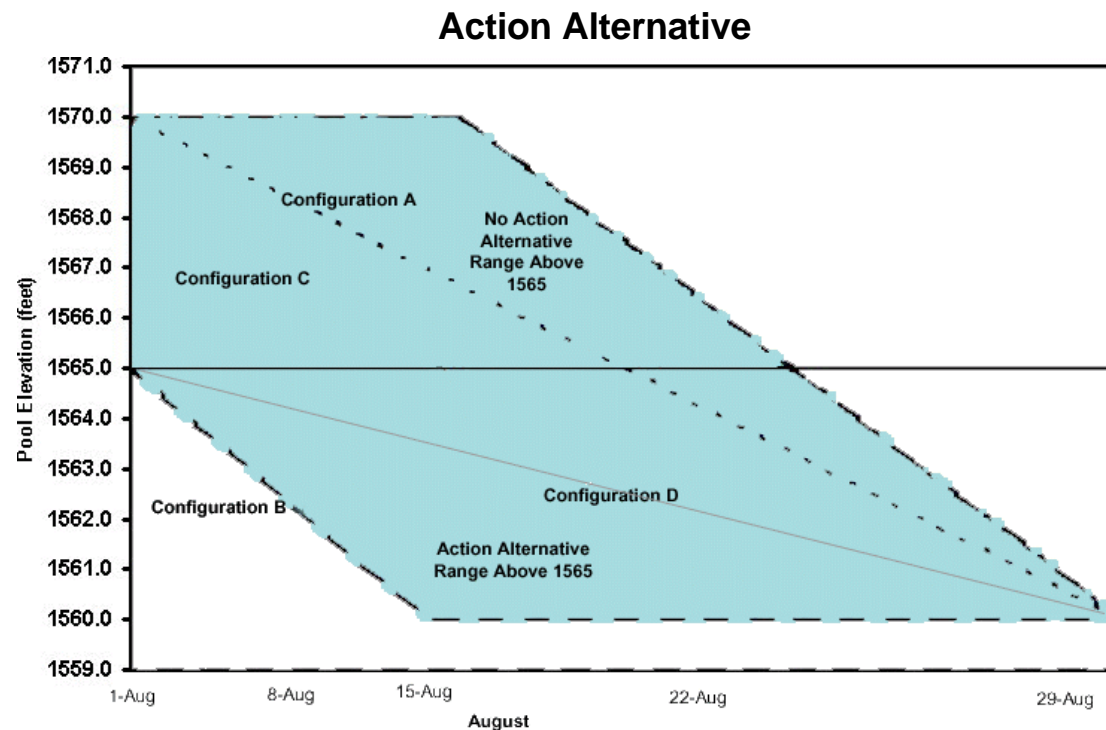
## Appendix B

### Drafting Configurations for “Action” and “No-Action” Alternatives



Action Alternative: The action alternative can be accomplished in a number of configurations. Four configurations were modeled. This reflects RPA Action No.31.

- A. Assume that beginning August 1, the pool elevation is at 1570 feet and is drafted evenly through August to elevation 1560 feet. This is equivalent to 260,800 acre-feet at a rate of 4,252 cfs.
- B. Assume that beginning August 1, the pool elevation is at 1565 and is drafted evenly through the first half of August. This is equivalent to 127,200 acre-feet at a rate of 2,275 cfs.
- C. Assume that beginning August 1, the pool is at elevation 1570 cfs and is drafted at the scheduled pumping rates to elevation 1560. This is equivalent to 260,800 acre-feet at the scheduled pumping rate of 7,923 cfs for August 1-15 and 6,750 cfs for August 16-31. This is equivalent to stopping the pumping operations on August 1<sup>st</sup> and allowing Banks Lake to draft to the target elevation and then begin pumping to maintain elevation 1560 through the end of August. It will take approximately 17 to 20 days to draw Banks Lake down at the expected average irrigation demand.
- D. Assume that beginning August 1, the pool elevation is at 1565 and is drafted evenly through August. This is equivalent to 127,200 acre-feet at a rate of 2,069 cfs.



No Action Alternative. (5 feet of Draft At Banks Lake.) Assumes that beginning August 1, the pool elevation is at 1570 feet. The volume of water between elevation 1570 feet and 1565 feet is equivalent to 133,600 acre-feet. The model results show the volume drafted using 3 configurations.

- A. Draft Banks Lake evenly through August to elevation 1565 feet. This is equivalent to a flow rate of 2,173 cfs.
- B. Draft Banks Lake evenly August 1-15 to elevation 1565 feet. This is equivalent to a flow rate of 4,490 cfs.
- C. Draft Banks Lake evenly August 16-31 to elevation 1565 feet. This is equivalent to a flow rate of 4,209 cfs.

### No Action Alternative

